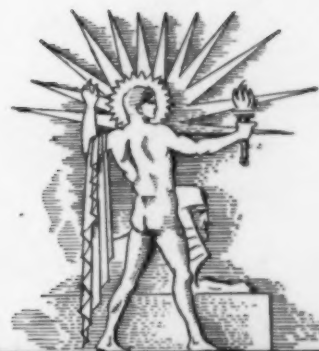
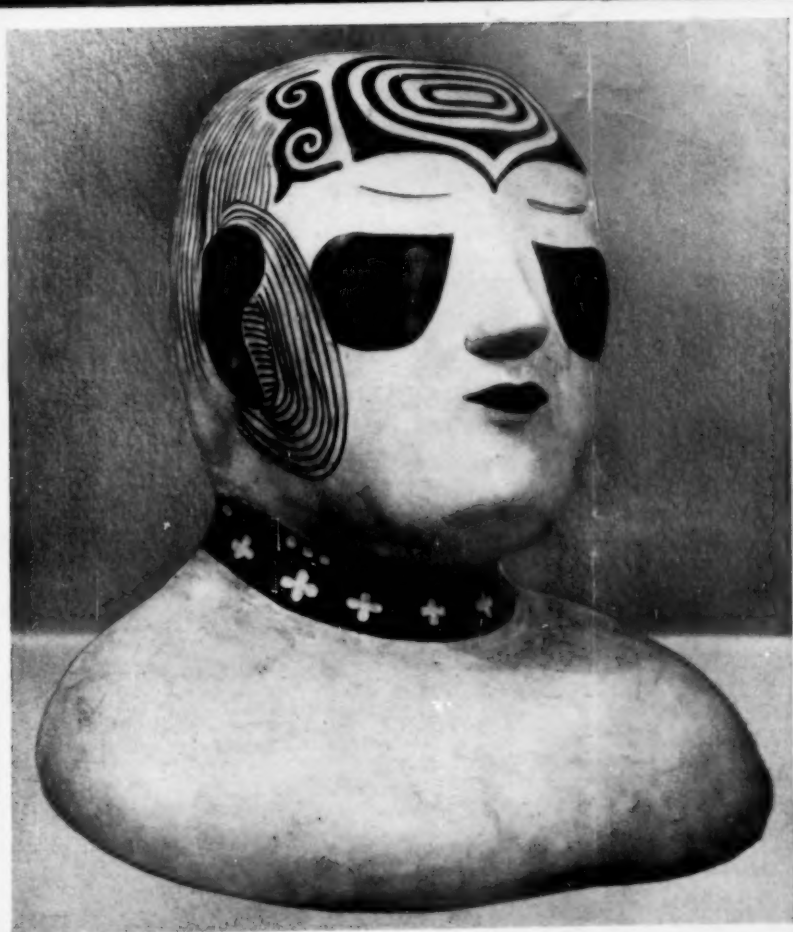


27 1933

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE.



MARCH 25, 1933

Death in Siberia

See Page 185

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DO YOU KNOW?

Weather observations have been telegraphed from stations since 1870.

Experiments indicate that quinine can be grown in the Philippines.

Eighty-five per cent. of the lemons consumed in the United States and Canada are grown in California.

Government scientists find that they can use rabbits in some of their experiments to test rations for dairy cows.

The upper atmosphere is warmed by ozone, is the conclusion based on spectroscopic experiments by an Oxford scientist.

A new dental lamp, a British invention, makes it possible for a dentist to do most of his work sitting, instead of standing all day.

Sharks have no bony framework, and when brought on land their bodies flatten so that they look very different from sharks in the sea.

There are about 217,000 Indians in the United States.

Some of the big old dinosaurs had jaws containing 2,000 teeth.

There are 100 million fewer apple trees in the United States now than in 1910.

Deaths from automobile accidents fell off 13 per cent. in the United States last year.

There are regions in Siberia where the ground is perpetually frozen hundreds of feet deep.

A statement from Cornell University says that while calf, beef, and pig liver differ in price, they are practically equal in food value.

California citrus fruit specialists have been developing a quick, simple test to enable packers to estimate more accurately the state of maturity of lemons.

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SEISMOLOGY

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When is it likely that life expectancy will be increased to 70 years? p. 184.

TEXTILES

Why does artificial silk crease easily? p. 185.

These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information of the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in U. S.

PHYSICS

Positron Formally Introduced; Negative Proton Predicted

Discoverer Has Found 15 Pictures of Positron Tracks
Among 1300 Photographs of Cosmic Ray Tracks

THE POSITRON has been formally introduced to the world of physics in a communication by its discoverer, Dr. Carl D. Anderson of the California Institute of Technology, to the *Physical Review*.

August 2, 1932, is given as the date of the first photograph of the positive electron, christened positron for short, which has the mass of the older negative electron but a positive electric charge like the proton which is nearly 2000 times more massive. (*SNL*, Sept. 24, 1932, p., 197; Feb. 25, 1933, p. 115).

A search for a negative particle of the mass of the proton was urged by Dr. Anderson, who predicted the possibility of its existence.

To date Dr. Anderson has obtained 15 photographs of positron tracks in a group of 1300 photographs of cosmic ray tracks. Positrons are let loose from atoms bombarded with cosmic rays. Dr. Anderson offers the following suggestion as to what happens:

"From the fact that positrons occur in groups associated with other tracks it is concluded that they must be secondary particles ejected from an atomic nucleus. If we retain the view that a nucleus consists of protons and neutrons (and alpha particles) and that a neutron represents a close combination of a proton and electron, then from the electromagnetic theory as to the origin of mass the simplest assumption would seem to be that an encounter between the incoming primary ray and a proton may take place in such a way as to expand the diameter of the proton to the same value as that possessed by the negatron. This process would release an energy of a billion electron-volts appearing as a secondary photon. As a second possibility the primary ray may disintegrate a neutron (or more than one) in the nucleus by the ejection either of a negatron or a positron with the result that a positive or a negative proton, as the case may be, remains in the nucleus in place of the neutron, the event occurring in this instance without the emission of

a photon. This alternative, however, postulates the existence in the nucleus of a proton of negative charge, no evidence for which exists. The greater symmetry, however, between the positive and negative charges revealed by the discovery of the positron should prove a stimulus to search for evidence of the existence of negative protons. If the neutron should prove to be a fundamental particle of a new kind rather than a proton and negatron in close combination, the above hypotheses will have to be abandoned for the proton will then in all probability be represented as a complex particle consisting of a neutron and positron."

Science News Letter, March 25, 1933

AGRICULTURE

Fallowing of Leased Land Will Pay Farmers Twice

FARMERS stand to make a second profit out of the portion of their land which would be leased from them by the Government under the provisions of the agricultural relief bill now before Congress.

They will get their first payment in immediate cash from the Treasury. They

PHYSIOLOGY

Spring Found to be Season Of Least Growth in Children

CHILDREN don't sprout up in spring like lilies and onions, but get fat in the fall like apples and pumpkins, it seems from studies recently completed by Dr. Carroll E. Palmer of the U. S. Public Health Service.

So if Junior and Sister show disappointingly small gains at their weekly or monthly weighings from now on for the next few months, parents need not be discouraged. Spring, traditional sea-

will get their second payment in increased fertility of their land through fallowing.

Land that "lies idle" for a year is not like a machine that lies idle for a year. The idle machine does not gain in value; even if it does not rust, it gets a year older and a year closer to obsolescence. Idle land, if it gets the stroking of plow and harrow called for by proper fallowing practices, grows better. It is not sucked out by hungry crop plants, and the busy bacteria living in the roots of leguminous plants or free in the soil capture nitrogen and leave it there, in the farmer's own personal bank, good against future drafts.

Science News Letter, March 25, 1933

PHOTOMICROGRAPHY

Common Box Camera Used with Microscope

THE COMMON low-priced box camera with which almost everybody begins his photographic career can be used effectively as a scientific instrument, to take photographs through a microscope. In the current issue of *The Botanical Gazette*, T. C. N. Singh, of Ravenshaw College, Cattuck, India, will describe a simple framework he has devised for holding such a camera in place on top of a microscope while the exposure is made.

The length of exposure varies according to a number of factors, including light, kind of film used and object to be photographed, Mr. Singh states. Under conditions of ordinary laboratory lighting, a two-second exposure produced good pictures.

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son of greatest growth, is the season when the child between 6 and 14 years make the least gain in weight, Dr. Palmer found in a study of 2,500 native-born, white, elementary school children.

Average growth in weight was greatest in the fall, least in the spring, and intermediate in the winter, Dr. Palmer observed. In May the average growth in weight was the very lowest of all the year. During the summer the rate of

growth began to pick up, and the growth was about equal to that of the late winter months, February and March.

During the sixth and seventh years, boys and girls grow at about the same rate. During the eighth and ninth years, the boys grow a little faster than the girls. During the spring of the tenth year, the girls begin to speed up and their growth rates become greater than those for the boys and they continue to grow faster during each season of every year until fall of the fourteenth year, when the boys take a spurt that keeps their growth rate greater during the fifteenth year.

Science News Letter, March 25, 1933

PHYSICS

Russian Physicist Explains Genesis of Gamma Rays

JUST what happens within an atom when gamma rays, such as are shot off from radium, are emitted is pictured by Prof. G. Gamow, of the Radium Institute, Leningrad, in a report to *Nature*. Gamma rays are those that produce effects on cancer and they are electro-magnetic waves more penetrating and shorter in length than light and X-rays.

Generally accepted views visualize the hearts or nuclei of the atoms made up of alpha particles, neutrons and, in the case of atoms of odd atomic number, one proton. The alpha particle is the heart of the helium atom.

Prof. Gamow explains that the alpha particles in the nucleus are all on the same level of energy while the neutrons are distributed on different levels of energy. The proton when it is present occupies the lowest energy level that is occupied by neutrons.

Suppose a neutron becomes unstable and shoots off part of itself as an electron in the form of a beta ray. A proton is the fragment of the neutron remaining. It seeks a drop in energy where protons belong. In changing from high to low energy level, energy is emitted in the form of hard gamma rays. This is the picture of the mechanism of radioactivity that Prof. Gamow has visualized. It explains why beta rays or electrons are often accompanied by high energy gamma rays.

Prof. Gamow's theory is supported by some experiments and he looks forward to its testing by other experiments.

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ARCHAEOLOGY

Stone Tool In Nebraska Cliff May Reveal Ice Age Americans

Study of Thumb Nail Scraper and Soil Where It Was Found Point to American Migration Before Last Ice Advance

A NEW, important-sounding clue to the oldest human inhabitants of America is reported by Dr. Earl H. Bell and Dr. William Van Royen of the University of Nebraska. The discovery may raise the question of man's presence in the New World as far back as the last great Ice Age, when mighty glaciers slowly moved down from their Arctic headquarters.

The clue to America's ancient men is a small stone tool such as primitive men shaped for their work of cleaning skins. It is a type that archaeologists call a snub nose or thumb nail scraper.

The tool was found in a partially cemented sand cliff, eight feet below the present surface. The discovery was made by Gladys Cape, of Dalton, along a creek ten miles from her home. Her father and a paleontology student at the University of Nebraska removed the artifact in a block of matrix for study.

As the resting place of the flint tool suggested great antiquity, Dr. Bell was consulted. He arranged to visit the site to examine the geological evidence in the hope of learning how long ago the tool-makers lived. The expedition was sponsored by the University of Nebraska, Science Service, and Col. G. L. Waters, of Lincoln.

Dr. Bell now reports that the flint tool, and several others from the same creek, must have come to their resting place before the sand bank took on its present contour. No evidence could they find of gopher holes, cracks, or other means whereby the flint objects could have been inserted into their hard bed. Nor could the tools have been buried by recent Indians. The ground is undisturbed.

"There can be little doubt," Dr. Bell declared, "that the age of the artifacts may be counted in thousands, rather than hundreds, of years."

As a conservative estimate, he figures that the tools were made no less than six thousand years ago.

There is some possibility, however, that the tools point indirectly to much

earlier inhabitants than this. They may show that men were in America in the inter-glacial period, before the ice sheet crept down for the fourth and last time from its polar home. This would mean that America has been inhabited at least 30,000 years.

Studies of the glacial age, by the Swedish scientist, Ernest Antevs, demonstrate that the last advance of the ice sheet raised an ice blockade across Alaska that would have shut out immigrants for thousands of years. This means that America's earliest immigrants from Asia must have crossed Bering Strait before the great ice blockade, or else they waited until it lifted. Either man is a really old inhabitant of the New World, over 30,000 years old, or else he is just a newcomer, occupying the land merely some eight or nine thousand years.

Studying the story of deposited soil and climate fluctuations recorded in the sand and gravel layers of the Nebraska creek, the University of Nebraska scientists are inclined to believe that the tools embedded here may point to an American migration before the last advance of the ice sheet.

The tools themselves are not so old as that. But it is believed that any race of men who reached Nebraska early enough to have their stone tools embedded in the sand bank must have entered the continent before the ice blockade formed across northern America.

Dr. Bell and Dr. Van Royen expect to make further studies of the site.

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ANIMAL PSYCHOLOGY

Stray Dog Nurses Full-Grown Cat

ONE ANIMAL waif that has adopted another as a foster-child, is the strange hard-times story told—and backed up with photographic evidence—by Miss Margaret Stanger, of Riverside Drive, New York. Tales of cats that nurse puppies are common

enough, or of motherly dogs that adopt kittens; but in the case reported by Miss Stanger a mongrel dog has adopted a full-grown cat and makes it play the role of a presumably lost puppy.

The two animals were both strays which came to the neighborhood, Miss Stanger states. "My photographs were taken on the third day of their acquaintance. They are friendly at all times except when food is put out, which the dog insists upon eating, forcibly keeping the cat at a distance while doing so. However, as soon as she has finished she shares with the cat in this fashion. . .

"As this is the only food the cat gets, it is a unique way of maintaining two pets on the food of one."

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ZOOLOGY

Cannibalistic Lizard Develops Forked Tail

A TWO-TAILED specimen of the leopard lizard was uncovered at Casa Grande National Monument, Arizona, in connection with road grading.

What caused the freak to sprout two tails instead of the customary one, is a matter of speculation. Superintendent Frank Pinkley, in charge of the southwestern national monuments of the National Park Service, suggests that the reputedly cannibalistic habits of this species of lizard might warrant the forked tail.

The two-tailed specimen now is on display at the museum of the Casa Grande National Monument.

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ETHNOLOGY

World's Return to Simplicity Is Declared Impossible

All Peoples Are Copying Western Ways; Will Not Give Up Material Things: "Man Would Rather Ride Than Walk"

HARASSED by the economic problems of a world leaping from one crisis to the next, there are some among us who wishfully predict a return to simplicity or who wistfully look to some other land as a refuge from the speeding western world.

A look at the future is presented in a recent book, *America's Tomorrow*, (Funk and Wagnalls), by Dr. C. C. Furnas, associate professor of chemical engineering at Yale's Sheffield Scientific School. America is leading a crusade of world uniformity which is enveloping the globe, Prof. Furnas contends in painting his picture of the era of the two-hour working day.

"We are not going to have the great variety of peoples and groups of customs which we now have," Prof. Furnas writes. "Each pure race on the globe, during its period of isolation, built up a series of beliefs, religions, social customs and crafts which were distinctive of the group and conditions in which they lived. We have come to attribute certain racial characteristics to each group, which first of all was reflected in the clothing. Clothing, all over the

world, is now merging into the standards set by Europe and America, and means of transportation and ways of doing things are rapidly following suit. In a relatively few years the modes of life will show no essential variations as we journey around the globe, and one of the really interesting phases of our existence will have passed away. It is a great pity, but it cannot be helped. However much freedom an individual may have as such, his race, whatever one it may be, seems doomed to be fitted into a relatively narrow pattern.

"What will the pattern be? Simplicity? Certainly not. We know how to make too many material things now ever to go back to a basis of simplicity. When we talk of what's going to happen tomorrow we must never forget the great fundamental principle that man would rather ride than walk. Poets moan for the mountains but stick to New York City. When it comes to the pinch, even Gandhi, the arch-enemy of modernism and the exponent of utter simplicity, has his appendix snipped out by Britain's best and most modern surgeons.

"Whether it is true or not, man, en masse, will always believe that it is best for him to have things and go places, and now that such a means of living has been found, through industrialism, it will never be relinquished. America leads in this industrialism, but this does not in itself close the door on other contributions.

"Where else can we go to find new peoples and places to set up experiments in new modes of living? Nowhere. Can the Orient come back in a second cycle and contribute something untried in manner of living and thinking? China, Russia and Japan certainly cannot. They are copying Western ways and Western science and rushing into the Western net as fast as they can urge their huge bulks.

"India? One often wonders about India. Sometimes it seems as if her chief function is (*Turn to Page 189*)



FRIENDLY EXCEPT WHEN THE DOG EATS

AGRICULTURE-GEOGRAPHY

Geography and the Farm Problem

By DR. ISAAH BOWMAN,
Director, American Geographical
Society

THE NEW administration at Washington has one overshadowing responsibility, to improve the lot of the farmer. One of our greatest difficulties is over-production. Many farmers are obliged to sell their grain crops at prices far below cost. The cause is in part a geographical question; to find a cure we are required to take account of the geography of the West particularly.

There is no more inspiring process in our history than the westward spread of people over our central Great Plains and to the Pacific. In the 90's the sweep of settlement was slowed down but it was not stopped. Even today in parts of the High Plains of western Kansas and Nebraska and eastern Colorado and Montana, virgin grassland is being plowed for wheat. I saw the advance of the plow in Colorado and Kansas as late as the summer of 1932 and much more of it in 1930.

Even the low price of wheat has not yet prevented new plowing. Droughts only temporarily halt it. The reason is that western wheat farmers have learned a trick—how to put big machines on cheap land and by "dry-farming" raise crops that can be sold at a profit. This was true even in the discouraging markets of 1930 and 1931 when the price dropped to 60 cents a bushel. At 30 cents and less all calculations went wrong and commercial wheat farming fell into a state of paralysis.

The wheat lands on the drier western border of the plains country are among the marginal lands of agriculture and in

their "continuing wise use" geography becomes an adjunct of statesmanship. No government can frame a long-range policy of real value unless account be taken of the peculiar geographical qualities of the marginal lands. I have called them pioneer lands because a pioneer is an experimenter and in the marginal lands experimentation is the first law of survival.

It was by experimentation that dry-farming was learned and the edge of the wheat belt pushed forward over the High Plains of Texas and carried west of central Kansas and Nebraska for at least 500 miles. It opened central Washington and northern Oregon and scattered wheat fields through a half dozen western states where only cattle ranges were known before. The use of more drought-resistant breeds of wheat helped the process vastly.

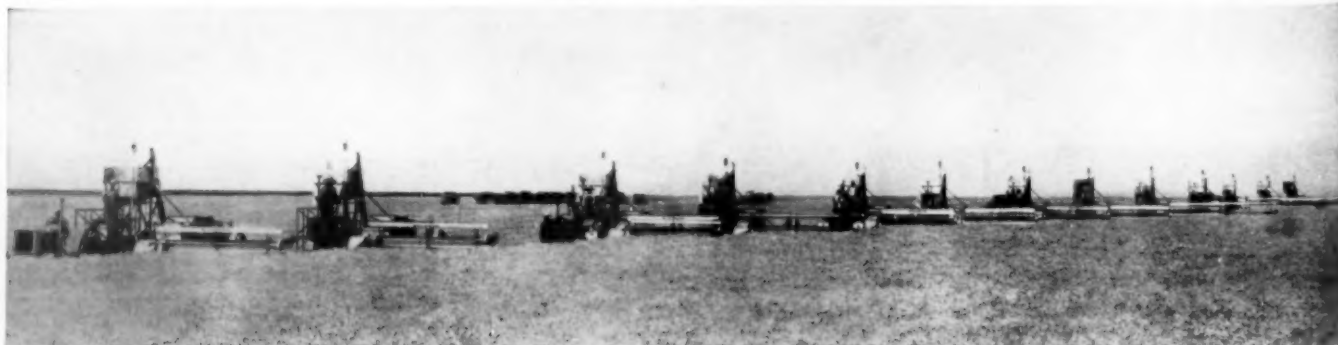
All of Us Experimenters

To some degree all of us everywhere are experimenters. New conditions face us daily. Galsworthy has reminded us "that the status quo is of all things the most liable to depart; the millenium of all things the least likely to arrive." But experimentation in the marginal lands is carried much farther than elsewhere. We of the better-favored regions have to adjust our minds to the fact, otherwise we miss the significance of the agricultural disease that is now epidemic in the United States, particularly in the West. At the root of that experimentation is climate. Nature takes a hand in the western wheat-growing lands and adds to the farmer's burden, withering his crop by drought and sun or beating it down by hail. The recent Red Cross

report on the drought of 1930 and 1931 describes it as a "major disaster" to which was added in parts of South Dakota and Nebraska the most destructive grasshopper plague in the history of those two states.

Our rainfall in the East may vary by several inches or many inches from year to year and we complain perhaps that the season has been too dry or too wet, when we are really very little inconvenienced by the change. How differently we should feel if our rainfall were 22 inches one year and but 7 the next! In such a locality there is moisture enough to permit a heavy crop one year and so little the next year as to result in complete failure. There would be no crop at all if wet and dry years came in a wholly irregular fashion because no one would risk seed and labor.

It happens, however, that both wet and dry years commonly come in groups. This means that grain and hay can be stored for use in bad years or reserves of cash built up to buy feed for live stock or to hire additional pasture. Even this would not be sufficient to enable the marginal farmer to survive if it were not for the fact that as a rule he has bought his land cheap or homesteaded it at little cost except for the "improvements" required by law. It is also in his favor that the taxes are relatively low because most marginal-land counties are new and thinly settled, with no large cities; and schools and other expensive machinery of civilization have not yet been developed to a state of burdensome luxury. Assessed at first as grazing land, some of the marginal wheat land is only beginning to rise in value and the tax gatherer has



MASS PRODUCTION IN AGRICULTURE

U. S. Department of Agriculture

Thirteen combines harvesting on a 6,500-acre wheat ranch near Adrian, Texas. When wheat sells for only 60 cents a bushel, dry-farming with big machines will raise it profitably on cheap lands.

not yet fully caught up with the pioneer.

The droughts and low wheat yield on dry land do not drive out the farmer for he knows that wet years will come again and in the meantime he enjoys a relatively low tax rate. But the whole system was worked out, largely during the period just before and just after the World War, when wheat was still commanding a good price. When both wheat and cattle dropped in price, not to half but to a third or a quarter of the prices that prevailed in the dry-farming boom, the marginal farmer had to face both the exceptional risks of climate and a demoralized market. If he owed money for improvements or for additional land or for live stock and seed, he was caught between two fires. In one such county four-fifths of all the families (4500 in number) in an area as large as the state of Connecticut have appealed for Red Cross aid.

Land Classified

Science does not stand still in the face of such a desperate situation. It is not sufficient to feed people in distress; it is the business of the government to find a cure based on sound scientific work. The Conservation Board of the U. S. Geological Survey has been at work for a number of years on the classification of the land in a broad strip east of the Rockies and running all the way from the Canadian boundary south to the panhandle of western Oklahoma. The results are shown upon a most valuable series of maps. Similar maps are now in preparation for the Great Basin covering a territory of equal extent. These maps may be called "risk maps." They show what degree of risk is involved in the use of the land as one goes from the belt of good soils and more reliable rainfall to the belt of poor soils and quite unreliable rainfall.

Were these maps followed they would vastly decrease the risks and the suffering now so prevalent in the region. But the dry-land farmer is an inveterate gambler. Again and again farmers have paid their debts and saved up cash in years of rainfall and plenty in areas marked on the land-classification maps as very risky. It has not been feasible and possibly not even desirable hitherto to say to a farmer "You shall not farm on a given territory because we believe you will fail."

The use of the marginal lands has greatly increased the wheat output of

the country and helped lower the price of wheat. They now represent areas of extreme distress. What is the policy to be followed in using them more intelligently? Here science can not complete the story. To say what shall be done with the marginal lands of either Kansas or New York State is a social and political question in part. It involves the standard of living of the marginal

GEOLOGY

Earth's Many Depressions Were Blessings in Disguise

IF IT IS any consolation to present sufferers from depression, mental or financial, having depressions and, what is more important just now, getting out of them are just beneficial incidents in the life of Old Mother Earth. Rough on some of the actors that strut upon the earth, the earlier depressions nevertheless, from the long time view, are beneficial.

Viewing the flux and flow of "good" and "bad" times from the standpoint of geological eras rather than the few years of our generation, Dr. Carey Croneis of the University of Chicago gives perspective to the current questioning of stability of civilization.

"The earth has enjoyed countless depressions, the most wide-spread of these, paradoxically enough, being at times of great mountain building," Dr. Croneis writes in *Scientific Monthly*. "And although some of the results have been so far-reaching that all life has seemed to have been blotted out, a few of the simple, sturdy stocks in actuality have always weathered the storm to build new and more glamorous family careers during the following period of inevitable world recovery. And for today's timid soul the most encouraging feature is this—the new forms of life have always been more advanced than those whose places depressions made vacant.

Hard Times are Good Times

"The parables from out of the past are clear: All hard times are really good times. Fortunes, families, mountain ranges and even continents rise out of depressions; all hard times are inevitably followed by good times, which, in effect, are bad times, inasmuch as in

farmer and the policy to be followed in forcibly limiting production or changing the use of the land by law. Science leaves that to policy makers, assigning only to itself as science the duty of analyzing the situation, mapping the belts and the degrees of risk, and explaining how communities are related to the land and to each other.

Science News Letter, March 25, 1933

them family fortunes, individual initiative, national ideals and even lofty mountains are so weakened or reduced that they are likely to be completely destroyed or at least radically altered by the time the next depression is well under way."

Riverside Drive, Michigan Boulevard, Unter den Linden, the Strand and Champs Elysée have all been beneath the ocean that has flooded what is now land scores of times. Great Britain is sinking at a rate which is sufficiently rapid to effect nearly complete submergence within the next 40,000 years.

Depression Killed Dinosaurs

Consider the really great "depression" at the close of the Mesozoic, that age of dinosaurs, when the reptiles, like Russian royalists, were nearly blotted out, never again to become dominant. Dr. Croneis reminds us that "the roots of the great modern spreading tree of mammalian types were firmly anchored in the very depression which was too drastic for the optimistic dinosaurs who, to the final crash, continued bullish on Brawn Not Brains, Inc."

Do these examples from the past convince? Dr. Croneis laments:

"Whether ancient, medieval or modern, — the historians, philosophers, courtesans, priests, soldiers, medicine-men, artists, pugilists, college presidents, tycoons, economists and politicians have all agreed that the history of the past is the prophecy of the future, but they have never failed to reconcile themselves to the thought that they, their affairs and their times are somehow exceptions."

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FORESTRY

**Sweden Surveys Forests;
Finds Regrowth Rapid**

THE NATION-WIDE government inventory, or census, of Sweden's forest supply has now been completed after eight years of incessant work and at a total cost of 1,400,000 kronor (about \$280,000 at present exchange rates). The almost gigantic proportions of this undertaking are illustrated by the report of the National Forest Inventory Commission.

The census was made by means of examining all trees within many parallel forest belts ten meters (30 feet) wide and drawn at certain fixed intervals. The combined length of the lines thus covered by the tree checkers is about 52,000 kilometers (31,200 miles) or more than one and a quarter times around the world, and the number of tree trunks marked and examined amount to more than 12,000,000.

The result of the inventory as a whole was most gratifying, in so far as it showed not only the forest wealth of the country but also indicated that the regrowth was considerably greater than what had generally been anticipated. Sweden's total forest area is about 23,181,000 hectares (approximately 58,000,000 acres) and the total amount of wood is 1,417,000,000 cubic meters (cubic yards). With the low lumber prices prevailing today, the present value of the wood contained in the Swedish forests is estimated to be at least 1,200,000,000 kronor (about \$240,000,000).

The investigators found that the regrowth is improving considerably. Another remarkable fact is the high age of the trees. In Lapland 32 per cent. of the trees were found to be over 160 years and 45 per cent. over 120 years old.

Science News Letter, March 25, 1933

STATISTICS

**Half of Future's Babies
Expected to Live 75 Years**

HALF OF ALL the babies in the future will live to be at least 75 years old Dr. Louis I. Dublin, vice-president and statistician of the Metropolitan Life Insurance Company, predicted in the second of the annual Cutter Lectures which he gave at Harvard Medical School.

This means adding ten full years to the present life expectation. Part of

this will be accomplished by further reduction of infant mortality.

"But more important is the real possibility of reducing the unnecessarily high mortality of persons in the middle ranges of life," Dr. Dublin said.

"The present mortality of persons between 50 and 65 years of age can be reduced by at least 30 per cent. through the application of known principles to personal hygiene. There is every reason to believe that this will be accomplished in the course of the next generation during which time emphasis will be placed more and more on what the individual can do for himself in leading a hygienic life.

"This achievement will have an extraordinary effect on the composition of the population in the next generation. If we, as a nation, succeed in enjoying an expectation of 70 years, the entire complexion of our common life will be changed.

"These changes should greatly increase human happiness. Much color and sweetness should be added to our civilization if the older generation could stay on to their natural life span properly cared for. The increase of longevity will, moreover, make unnecessary the maintenance of high birth rates in order to balance our numbers. This will mean a real economy of the vital resources of the family and of the nation."

Science News Letter, March 25, 1933

ZOOLOGY

**Beaver's House Afire;
Ranger Puts it Out**

FIREMAN to His Furry Excellency, the Beaver, was the role played during a forest fire by Ranger Curtis Skinner of the National Park Service. While Mr. Skinner was getting a portable pumping outfit into position to battle the flames in the woods of Yellowstone Park, he noticed that the dry sticks of a beaver house were in flames, and saw three of the occupants desert it in terror. He quickly coupled up a nozzle and turned a stream of water on the flaming house, soaking it down thoroughly.

Then he turned to the more serious business of fighting the forest fire, but as he did so, he saw one of the evicted tenants of the beaver house returning to his recently threatened home. A slap of the animal's broad tail on the water Mr. Skinner interprets as a "Thank you."

Science News Letter, March 25, 1933

IN SCIENCE

EDUCATION

**Microphone Used in
Teaching Surgery**

RADIO has found its way to the operating room. A Los Angeles surgeon, Dr. Rafe C. Chaffin, now wears a microphone under his face mask while operating, so that he may describe the operation step by step to his students in the amphitheater. His application of microphone, amplifier and loudspeaker to the teaching of surgery is reported in the current issue of the *American Journal of Surgery*.

Science News Letter, March 25, 1933

ARCHAEOLOGY

**Skeletons of Aborigines
Discovered in Missouri**

FOLLOWING the clue furnished by a groundhog, two hunters have discovered the fireside and skeletons of an ancient American family, in a secluded canyon near Hartsville, Mo.

The hunters, John Sullins and George Hadley, reported that while in the little canyon known as Jug Hollow they noticed bits of broken pottery brought to the surface by groundhogs. The hunters sought picks and shovels and excavated, finding an ancient hearth stone. Dead at their fireside were the remains of an Indian family consisting of two adults and a young child.

The skeletons were disintegrated into a brittle condition, and were buried under about three feet of debris. Another evidence of the age of the household is the lack of metals, pointing to a prehistoric Indian culture.

The skeletons were accompanied by the family's stock of stone knives, arrows, and spear heads. There were four large mortars and pestles, and as this would be more equipment than one small family required, it is thought that a larger group of people must have sheltered themselves under the cliff in this little valley. Bones of bear and other animals were also found.

The skeletons have been removed to the local school for preservation.

Science News Letter, March 25, 1933

IN FIELDS

PHYSICS

More Data Uphold Idea Of Cosmic Rays as Electrons

A REITERATION that cosmic rays are probably electrons or other electric particles coming to earth from outer space and being deflected by the earth's magnetic field in such a way that the intensity is greater for high latitudes than near the equator is contained in a detailed report by Dr. Arthur H. Compton of the University of Chicago, appearing in the *Physical Review*.

Summarizing the researches of more than sixty physicists in a geographical study of cosmic rays throughout the world Dr. Compton finds that at sea level the cosmic ray intensity at high latitudes is 14 per cent. greater than at the equator, at 2000 meters (a little over a mile) it is 22 per cent. greater, and at 4360 meters (over two miles high) it is 35 per cent. greater.

"Consideration of the conditions necessary for deflection of high-speed electrified particles by the earth's magnetic field indicates that if the cosmic rays are electrons, they must originate not less than several hundred kilometers above the earth," Dr. Compton writes.

He finds that his data can be quantitatively explained on the basis of the Lemaitre-Vallarta theory of electrons approaching the earth from remote space.

Science News Letter, March 25, 1933

TEXTILES

X-Ray Study Points Way To Better Synthetic Silk

THE FIBER of natural silk is composed of several layers, the innermost consisting of highly oriented molecules and therefore having great tensile strength, while the outer layer is nearly free from orientation, X-ray experiments by Prof. Hermann Mark, director of the Physico-Chemical Institute of the University of Vienna and Dr. G. von Susich of Ludwigshafen, Germany, have shown.

Molecular orientation, these investigators found, increases tensile strength but

also leads to creasing. The structure of natural silk fibers is such as to give strength and yet prevent creasing.

Our present rayon or artificial silk fails in the latter respect because all highly drawn fibers have highly oriented surfaces and unoriented cores. The result is that although their strength is two or three times that of a normal fiber yet they are considered inferior in quality to the natural product because of their tendency to creasing.

Now that the cause of this is known it is hoped that a synthetic silk as good or better than the natural product will be produced.

Science News Letter, March 25, 1933

ARCHAEOLOGY

Blond Siberians With Painted Masks Unearthed

See Front Cover

GRAVES of mysterious blond and chestnut-haired people, who had a strange custom of making painted plaster masks for the dead, have been found by Russian scientists in Siberia, in the Minusinsk region. Word of the discovery was brought to the University of Pennsylvania Museum by Eugene Golomshtok.

Burial pits of the first centuries of the Christian era contained mummified remains of a chestnut-haired people, lying on wooden platforms and surrounded by rather poor possessions of pottery, iron and bronze, and wood. On their faces were plaster masks, painted with red cheeks and lips and nostrils, and with designs on the forehead. The inside of the masks were even more interesting, for they preserved the complete facial outline of the dead, even to wrinkles of face and neck. The impressions of these masks show that the people were beak-nosed, narrow-faced folk with long heads, and blond and brown hair.

Who the masked people were, is not yet known. Chinese historians, says Mr. Golomshtok, describe a tribe of "Gian-Gun" in western Siberia as having red hair, rosy cheeks and blue eyes. Another possible clue is that a great migratory movement began in Asia about the second century before Christ. The Huns who dominated Mongolia may have played a role in this region.

The hawk-nosed people of the masks succeeded a much richer type of culture in this part of Siberia. They in turn were succeeded about the fourth century A.D. by a people who had flat, round faces.

Science News Letter, March 25, 1933

CHEMISTRY

Synthetic Vitamin Manufacture Predicted

SYNTHETIC vitamins manufactured by organic chemists from cheap and plentiful raw materials were predicted by Dr. George Oliver Curme, Jr., in the annual Chandler lecture which he delivered upon the occasion of his receiving the 1933 Chandler medal for researches in chemistry. Dr. Curme directs the research of the Carbide and Carbon Chemicals Corporation.

Vitamins A, B, and C have been found to be closely related to substances of complex molecular structure, so that synthesis "seems entirely possible," he explained. In the case of other vitamins less is known although it would be surprising from the information now available if they were beyond the range of synthetic chemistry. He predicted that adequate supplies of vitamins will soon be available from relatively cheap and abundant sources and that under the guidance of physiological chemists and dietary experts synthetic chemistry will be able to add another triumph to its many past successes.

Science News Letter, March 25, 1933

SOCIOLOGY

Garbage Supports Depression Greenhouses in Germany

SEVERAL of the larger German cities are solving part of their depression problems by a hook-up of garbage-burning plants and greenhouses. Unemployed men are given jobs building the greenhouses and running the incinerators. Ashes from the burned garbage are used as fertilizer, and heat from the incinerators keeps the greenhouses warm. Plants that thrive on high-potash fertilizers, like tomatoes, cucumbers and cut flowers, are grown in the greenhouses.

H. A. Kirsch, a Berlin engineer who describes the projects in *Die Umschau*, states that employment in building will be given to about 25,000 men, and that for running the finished establishment two or three thousand families can be crossed off the rolls of those receiving public aid. The projects are expected to be self-liquidating, in that they will supply large quantities of high-grade fresh vegetables that have hitherto had to be imported.

Science News Letter, March 25, 1933

ETHNOLOGY

"Word Swallowing" Links Indians of Two Americas

DID YOU ever hear a singer swallow his words with a gulp? Probably not. It isn't the technique taught in music schools.

But two explorers for the Bureau of American Ethnology have discovered that word swallowing is a trait in two American musical circles. Seminole Indians in the Florida Everglades do it. So do the Jivaro head-hunters in the forests of Bolivia. That Indian tribes so widely separated should have so curious a trait in common is decidedly remarkable.

The Seminole trick of word swallowing has just been discovered by Miss Frances Densmore, who spent the winter among four Southeastern tribes, studying their music. Stopping off at the Bureau of American Ethnology in Washington, on her way home to Red

Wing, Minnesota, Miss Densmore described the Seminole singing trick to M. W. Stirling, chief of the Bureau.

Mr. Stirling leaned forward with interest.

"Did it go this way?" he asked, going through the motion of throwing his words back and swallowing.

"Exactly," said Miss Densmore.

He met the trick just once, Mr. Stirling said, among the Jivaros of South America, when he was on an expedition there last year.

The little trick of musical technique is of unusual interest to ethnologists who are seeking evidence on the ancient history of America. When distant tribes have significant traits in common, there may be clues to old migrations or to the direction taken by ancient waves of Indian culture. (Next Column)

PHYSICS

Beryllium Atoms Radioactive; New Helium Variety Predicted

A NEW and striking case of radioactivity, the spontaneous explosion of beryllium atoms, is the discovery announced at the California Institute of Technology by Dr. R. M. Langer and his associate, Russell Raitt, a graduate student.

This is probably the first successful prediction of radioactivity and it promises to lead to many others. Dr. Langer and Mr. Raitt first predicted the radioactive disintegration of the metallic atoms of beryllium and then systematically searched for the expected effect until they found it.

The effect of the explosion is so weak that the physicists know that the average beryllium atom will live a hundred trillion years (100,000,000,000,000 or 10 to the fourteenth power) before exploding. Extended researches show that none of the known radioactive elements can be responsible for the effects that the experimenters attribute to the beryllium atoms.

Beryllium is almost as unlike the ordi-

nary radioactive elements as it is possible to be. It has a mass only nine times that of hydrogen whereas the most active radioactive elements have masses ten or more times larger.

Data gathered from studying the spontaneous explosions of beryllium atoms into fragments are expected to provide powerful tools in unravelling the mysteries of the atomic nucleus.

The radioactivity of beryllium accounts for the puzzling fact that beryll minerals often contain much more helium than could be explained on other hypotheses. Helium is set free when beryllium explodes.

Of great interest to physicists also is the prediction by Dr. Langer and Mr. Raitt that a new form of helium atom will be found in the future. This has a mass of five instead of the usual mass of four, and it is predicted that this heavy helium will explode spontaneously and thus prove to be the lightest radioactive element.

Science News Letter, March 25, 1933

In the music of Southeastern Indians, Miss Densmore found new clues this winter, pointing to ancient, forgotten contacts with tribes farther south.

She heard Choctaw Indians in Mississippi sing their dance songs, without music of rattle or drum. She attended a dance and recorded songs. Dancing without instrumental accompaniment is unheard of among North American Indians. The nearest Indian neighbors to the Choctaw who dance without the drum would be the Tule of Panama.

Science News Letter, March 25, 1933

MEDICINE

Sufferer Helped By Baths Of Poison Ivy Extract

DAILY BATHS which contained gradually increasing amounts of poison ivy extract were resorted to by one poison ivy sufferer when all other methods of treatment failed. This method did no harm and enabled the patient to withstand successfully further attacks of the poisoning.

In order to avoid bringing on an attack by the treatment, the dilution of extract must be very great at first, and the amount of extract must be very gradually increased, warned Dr. F. E. Maisel of New York in reporting it to the *Journal of Allergy*. He suggested that the method might prove equally helpful in skin irritations due to contact with other substances besides poison ivy. In such cases, of course, the extract would be made not from poison ivy, but from the irritating substances concerned.

Science News Letter, March 25, 1933

PESTS AWAY FROM HOME

by

Dr. L. O. Kunkel

—of the Department of Animal and Plant Pathology, Rockefeller Institute for Medical Research.

This address will be given Friday, March 24, at 12:45 P. M. over stations of the Columbia Broadcasting System. Each week at this time a prominent scientist speaks over the Columbia System under the auspices of Science Service.

CHEMISTRY-BIOLOGY

Constitution of Protein

"A Classic of Science"

Analysis and Synthesis of Proteins Will Aid Biology In Understanding the Mechanism of All Life Processes

UNTERSUCHUNGEN ÜBER AMINOSÄUREN, POLYPEPTIDE UND PROTEINE (1899-1906) von Emil Fischer. Berlin, Julius Springer, 1906. Translated for the Science News Letter by Helen M. Davis. This is a literal translation of extracts from the original publication.

SINCE protein materials are concerned in one way or another in all chemical processes in living organisms, we may expect from the determination of their structure and their metamorphoses reactions of the greatest importance to biological chemistry. It is therefore no wonder that the study of this material, which chemists for more than a generation have avoided almost entirely, because they found satisfaction in perfection of synthetic methods or in the study of simpler natural compounds, was kept up by physiologists in ever increasing numbers and with unmistakable success. Nevertheless, the initiated have never doubted that organic chemistry, which was cradled close to the proteins, would finally turn back to them again. But opinion was and is still today divided over the point where co-operation between biology and chemistry would be successful.

While cautious professional colleagues fear that rational work upon this class of substances, on account of their complicated structure and their most inconvenient physical properties, even today will meet with insurmountable difficulties, other optimistically minded experimenters, among whom I will count myself, incline to the view that at least the attempt should be made,

Emil Fischer (1852-1919) worked for years to clear up the complex relationships of organic chemical groups occurring in the tissues of living matter. In 1906 he succeeded in synthesizing a true protein formed of a chain of 18 amino acids. Ten years later another group of workers using his methods succeeded in introducing one more amino acid group into the molecule. Some one remarked at the time that at that rate synthetic beefsteak would cost \$250 per lb. As Fischer shows here, the value of such work lies elsewhere than in the mere complexity of compounds which can be built up.

with the aid of all modern methods, to attack the impregnable fortress; for only through the venture itself can the limit of power of our methods be ascertained. The sober critic will at any rate not be able to gainsay the right to discuss the prospect of success when it compares the present knowledge with that which is necessary to reach the goal.

In respect to the determination, isolation and biological characterization of the numerous natural proteins, physiological chemistry has accomplished remarkable things. We know several dozen sharply differentiated members of this class, which can be arranged in groups according to their solubility and rate of precipitation, and of these many can be obtained in crystalline form. We know further that the several individuals are carriers of different biological functions. We know, finally, that all these bodies under the influence of different ferments undergo deeprooted, characteristic decompositions.

In spite of all this, our knowledge of their chemical composition is quite limited. If we look for the results of elementary analysis, they are confined essentially to the results of hydrolysis, which can sometimes be accomplished by acids and alkalies and at other times by the digestive ferments. All proteins are made up of ammonia and from it, one after another, of albumins, peptones and finally amino acids. About the nature of the first two cleavage products we are scarcely better informed than about the protein itself.

So successful has the study of amino acids been hitherto that for many, not only has the structure been determined, but the synthesis has been effected. On this basis therefore chemical investigation, which has set itself the task of clarifying and artificially reproducing the peptones, albumins and proteins, must build further.

Filled with this conviction, when I

made the resolution six years ago to devote myself to study of the proteins I began with amino acids, in order to get from a better knowledge of them new viewpoints and methods for their complex derivatives.

The outcome has not disappointed my expectations. It was successful first through use of the ester in finding a new means of separation for the mono-amino acids, which has become a worthwhile method for hydrolysis of protein, and not only aids in isolation of known amino-acids, but also has made possible the discovery of new members of that class.

Still more important seem to me the methods found in the same way for the conversion of amino-acids into their amid-like anhydrides, for which I have chosen the collective name "polypeptides". The higher members of this class of synthetic bodies are in respect to external properties, definite color reactions, behavior toward acids, alkalies and ferments, so similar to the natural peptones that they may be considered their nearest relatives, and that I may reckon their production as the beginning of the synthesis of natural peptones and albuminoses. . . .

Structure and System of Proteins

Chemical and physiological literature is not lacking in consideration of the constitution of albuminous bodies. We meet all gradations from modest remarks about the linkage of amino acids to pretentious, highly fantastic structural formulae. So far as I have been able to form an opinion, most of the views agree that in the protein molecule the amino acids are linked as amides.

**"He drew a Horse-Pistol,
'Twas raised from a Colt."**

The patent of the original
Colt's Revolver
will be

THE NEXT CLASSIC INVENTION

This idea in most detailed form is well treated by Hofmeister, but he would not in the least wish to advance a claim to being its originator, for all synthetic researches on the linkage of amino acids, among others the discovery of glycyl-glycin which occurred shortly before his publication, are based upon the same hypothesis.

In the great similarity of artificial polypeptides to peptones, especially with respect to their behavior toward pancreas-extract, also in the preparation of glycyl-d-alanin-anhydride from silk, one may find a new, strong support for this idea. The possibility that from the already known natural amino-acids one may by this sort of linkage alone build up, theoretically, quite a splendid number of proteins is at hand and is fully explained in popular form by Hofmeister. The structure naturally becomes even more complex through the participation of amino-dicarbon acids (asparagin- and glutamin-acids), as well as diamino acids (eysin, arginin, etc.).

But here I might call to attention that the simple amide formation is not the only possibility of linkage in the protein molecule. On the contrary, I consider it even quite probable that sometimes piperazin rings occur there, whose easy disruption by alkali and reformation as dipeptides or their esters I have so frequently found in artificial products, and that at other times the many hydroxyls of the oxyamino acids are by no means indifferent groups in the protein molecule. The last can by intramolecular anhydride formation go over into ester- or ether-groups, and the multiplicity would still be increased if we consider poly-amino acids as true components of albumins. There is no reason to spin out these considerations, but still it seems to me important to refer to the various possibilities, to prevent the all too one-sided views which the experimental investigation might leave behind.

In the formation of protein and its various complex derivatives, nature has, so far as we know, reached her highest chemical performance, and it would contradict all experience of organic chemistry and biology if she had here limited herself to only a few types.

As the great number of amino acids and their constantly changing composition already shows, there occurs in the composition of protein a disproportionately greater complexity than in the car-

bohydrates and the fats. If to that is yet added the various possibilities of linkage, which I have indicated above, the proteins have a chemical character which is equal to the extremely complex purpose for which they are used by nature, for the structure and the functions of the organs. . . .

The methods of building the polypeptides depicted above are so manifold that they will permit synthesis of numerous and quite complex combinations

FAULTS IN CALIFORNIA CRUST THAT CAUSE EARTHQUAKES



EARTHQUAKE MAP

The Long Beach earthquake of March 10 had its center along the fault, shown by black line, in the ocean floor that lies offshore from Los Angeles. Other black lines on the map show slipping planes or faults in California's earth crust that have caused earthquakes in the past or are likely to cause them in the future. The famous 1906 San Francisco earthquake was along the San Andreas fault. This map is based on data collected by H. O. Wood, Carnegie Institution of Washington seismologist.

of the natural amino acids, if we do not count the work and expense.

But the indiscriminate increase of forms would perhaps not be worth the trouble. More important seems to me the need, which practice in experimental treatment of the synthetic products supplies, of discovering newer methods of separation of their natural relatives from the peptones. The synthesis of glycyl-d-alanin-anhydride from silk serves as the first example of this. Hope

seems to me therefore established that it will belong to the not too distant future to isolate and artificially reproduce the most important members of the natural peptones and even the albumoses. But in order to handle a great number of single individuals in the very diverse combinations of the proteins the work of many hands will be necessary. Far more difficult is the problem, naturally, for the true albumins, since, for their reconstruction out of the first products of hydrolysis, wholly new methods must be produced, and even when these principles are established, their application in each separate case will most probably be a tedious work. We may therefore question whether the ultimate success will correspond to the labor spent. That in my opinion depends upon the use which biological research can make of it, and this is again limited by the means by which the synthesis will be effected.

If today, through a lucky accident, by the aid of a violent reaction, e. g., by melting together amino acids in the presence of a dehydrating agent, it should happen that a true protein should be formed, and if it were further possible, which is still more unlikely, that the artificial product could be identified with a natural substance, little for the chemistry of the albuminous substances would be gained thereby, and practically nothing at all for biology.

Such a synthesis I might liken to a traveller who passes through a country on a quick trip, and can tell scarcely anything further about it. The case is entirely different if the synthesis is compelled to go forward step by step and build up the molecule substance by substance, as was pointed out above for the polypeptides. Then it is like a foot traveller who seeks out his way step by step with intense attention, who must try out many roads till he has found the right one. He learns from his long, tiresome wandering not alone to know the geography and topography of the country, but he will also be conversant with the language and customs of its inhabitants. When he has finally reached his goal, he is able to find the right direction in every corner of the country, and if he writes a book about it, other people will be able to do so too.

I might therefore consider it an absolute blessing that synthesis has to devise many new methods of formation, recognition and isolation, and to study accurately hundreds of intermediate products, before it may reach the

proteins. For these methods will in the end serve not alone to produce all the proteins of nature and many more still than they have produced; they will presumably also serve to clarify the numerous and important transformation products of protein which play so great a role as ferments, toxins, etc.

We may shortly expect that through thoroughgoing and far extended synthetic work the whole region now still so dark will become a land of chemical culture from which biology can draw a great deal of the help which it needs for the solution of its chemical problems.

Science News Letter, March 25, 1933

ARCHAEOLOGY

Prehistoric Measuring Cups Studied in Vienna Museum

A PAIR of measuring cups used by some tribe that inhabited the Danube Valley in Bronze Age times, about 2000 years before Christ, have been presented to the National Museum of Lower Austria. So far as can be determined, they represent the only liquid measures of a people in the prehistoric stage of culture that have so far been discovered.

The two earthenware cups were excavated near Vienna about 19 years ago, but did not come into possession of the museum until recently. Dr. Friedrich Wimmer, struck by their similarity in shape and by their lack of resemblance to other pottery from the same locality, conjectured that they might be measures, and made an accurate examination of them.

They are both cylindrical in general outline, and each has a small handle near the top, very much like the handles of measuring cups in modern kit-

chens. The smaller of the two contains a trifle less than a sixth of a pint, and its larger companion almost exactly twice that quantity.

When these cups were in use in the prehistoric neighborhood of Vienna, the high civilizations of Egypt and Babylonia had elaborate systems of measurement; but so far Dr. Wimmer's investigations have not shown any definite relations between these two cups and their contemporaries to the southeast.

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From Page 181

to furnish the West with a supply of Yogi for the sole purpose of fleecing succulent ladies for silly lecture courses in unworkable hokum philosophies. Again, she seems best suited to keep the British lion alive by giving him something to worry about. Then again one wonders if India does not have something to say which is worthy of thought; but when one matches that idea with the squalor and wretchedness of many phases of Hindu life he turns away and faces west again. No, India seems doomed to sterility. The world will not look kindly upon her offerings until she pulls herself out of her (*Turn Page*)

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low material state, and this she probably cannot do except by Western methods, thus making herself a copier and not a contributor.

"The old sites of civilization—Asia Minor and the south shore of the Mediterranean—are rather stale peanuts as far as being world's leaders are concerned. The paucity of their mineral and agricultural resources precludes the possibility of their ever raising much dust in the world again. If these quarters could turn out a good second-edition Arabian Nights we might feel differently about the matter.

"The north shore of the Mediterranean has had its little ancient dance and is now buying Westernisms with every boat that comes. South America, South Africa, Australia, New Zealand! All living the ways of the West."

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Despite their names, Iceland has only 5,500 square miles of glacier; whereas Greenland is green only along a narrow fringe during a few months of the year.

A volcano museum is being established on the island of Martinique, in sight of the great volcano Mont Pelée.

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GENETICS

Ridding Beard of Roughness Saved Wisconsin Barley Crop

"OUT OF ROUGH and black, get smooth and white."

This problem, reminiscent of one of the ancient riddles of the Sphinx, confronted Prof. B. D. Leith of the University of Wisconsin, at one stage of his endeavor to produce a new strain of barley that could be grown with profit by farmers in Wisconsin and other Grain Belt states.

It was not so impossible a task as it might sound, for he had already put the smooth and the white qualities into the genetic mixture where they were covered over by the rough and the black. All he had to do was plant his cross-bred grain and let the old reliable Mendelian mode of segregation work.

To go back to the beginning: Wisconsin farmers used to raise a strain of barley known as Oderbrucker. It was good barley, good for stock feed and good for the once-great Milwaukee brewing industry. But it had one fatal drawback: the beard on its heads was armed with innumerable little back-pointing barbs that would cause these bristly hairs to work their way through the threshermen's overalls, and made life so miserable for them that they finally rebelled at working with it at all. Also, it was subject to a destructive fungus disease known as stripe.

Seed From Russia

Prof. Leith set to work to produce a hybrid barley that would have a smooth beard, and if possible be stripe-resistant, yet preserve the virtues of Oderbrucker barley—good white grain, high yield and stiff straw. His first crosses, with other strains of domestic barley, were not very successful. But in 1917 a new smooth-bearded barley from Southeast Russia was brought in. It was black-grained, but that did not bother Prof. Leith, for he was sure he could juggle the undesired color character out of the hybrid strains he would produce.

When he crossed Oderbrucker with the new Russian barley the first generation offspring were as undesirable as could be imagined, for the beard was as rough as in Oderbrucker and the grain was black as in the Russian barley.

Here, then, was his Sphinx-riddle; out of black and rough to get smooth and white.

Prof. Leith, like all good students of Mendelian behavior in heredity, knew that the blackness and roughness were "dominant" characters, in any mixed strain hiding but not destroying their "recessive" opposites, whiteness and smoothness. He knew also that such recessive characters segregate out when the hybrid first generation is inbred.

One in Sixteen

This he did, and the second generation barleys came out in approximately the following ratio: 9 rough and black, 3 rough and white, 3 smooth and black, 1 smooth and white. The last, a hybrid containing only recessives in its pairs of characters, was what he was hunting for; and he knew also that so long as it was inbred neither roughness nor blackness could reappear.

This smooth-white strain forms the basis of the barley strain now known as Wisconsin Barbless, Pedigree 38. In several years of practical crop growing by a large number of farmers, some of them outside the state, it has out-yielded Oderbrucker, resisted drought, and proved highly resistant to stripe, though not to other diseases. Most important of all, its smooth beard makes it possible to harvest and thresh the new barley without making life a burden for the farmer or the threshermen.

With an eye to the eventual return of beer, the owner of one of the most famous of the old-time Milwaukee breweries has made large-scale tests of the malting qualities of the new barley at his own expense, and reports that so far as its chemical makeup is concerned it is at least the equal of the best of the old barleys.

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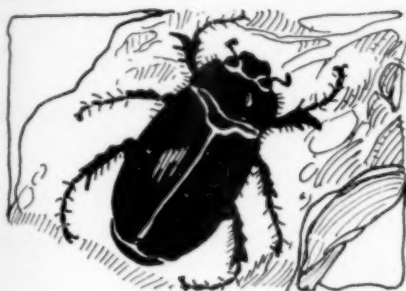
Girls of ancient Greece jumped rope, it is believed, judging from a somewhat damaged figure on a broken tablet.

Diamond-back rattlesnakes grow as long as eight and one-half feet; larger specimens have been described, but science waits to be "shown."

ENTOMOLOGY

NATURE RAMBLINGS

by Frank Thone



An Overworked Word

ISN'T IT ODD how the short and simple word "bug" is abused and overworked!

In strict propriety, a bug is an insect belonging to one particular natural order, the hemiptera, or half-wings, so called because the outer pair of wings in many of them is short, only half covering the inner pair. These true bugs include such familiar (often too-familiar) insects as squash-bug, stink-bug, chinch-bug, harvest-fly or cicada and the giant water-bugs one sometimes finds stunned under street lamps in summer. All these real bugs have piercing beaks, which when not in action are folded back against the body but when needed are sunk into plant or animal tissue for the purpose of sucking sap or blood.

One real bug whose beak is sometimes used on human beings to their acute distress and confusion is given a variety of more or less facetious euphemistic aliases, such as "couch cootie," "jailer's pet," and so on. The plant known as bugbane was named for its supposed ability to drive out these vermin when rubbed on walls and along cracks.

But the name "bug" has been stretched far out if its proper meaning as applied to the true bugs. It is used loosely to mean any insect, as in the cases of the lightning-bugs and June-bugs, which are really beetles. Still more loosely, it is applied to almost any small creatures, even down to bacteria and protozoa. Nor are such liberties with the language confined to the uninitiate; you will often hear the very high priests of science themselves saying bugs when they mean bacteria.

Where this poor word "bug" got into

the language nobody knows. Even the Oxford Dictionary, weightiest of authorities, hesitates to tie it up solidly with the now archaic old English word "bug" meaning a goblin or spook. Because of the prevailing use of "bug" to mean an insect or other small organism, this old word has become obsolete, except in such compounds as bugbear, bugaboo and bogie-man.

In older days, when men had more leisure to spell things out, this kind of a "hant" was usually written "bugge"; Wycklif so used it in his fourteenth-century translation of the Bible, to mean a scarecrow.

The ghostly "bugge" got into English, apparently, from Wales, for Welsh as well as other Celtic languages have plenty of "bug"-words. The original form, in Welsh, seems to have been "bwg." It also had numerous derivatives, such as "bwgwth," to terrify, and "bygwd," a hobgoblin or phantom.

Science News Letter, March 25, 1933

CHEMISTRY-HOME ECONOMICS

New Milk-Corn Food May Get Trial in White House

IN THE MENUS and budget of the first home of the land, the White House, presided over by its new mistress, Mrs. Franklin D. Roosevelt, novel "made-in-America" economy foods promise to play an important role. Mrs. Roosevelt is considering the use of special low-cost foods developed and introduced by nutrition specialists, particularly those at Cornell University with whom Mrs. Roosevelt as wife of the governor of New York had contact.

One of these foods that may be sampled upon White House tables is called "milkorno." The ingredients of this low-cost food are chiefly milk and cornmeal, from which it takes its name. The proportions are 65 per cent. cornmeal, 33 per cent. dried skim milk and 2 per cent. salt. It may be made by anyone having the necessary facilities for mixing it.

For Any Meal

Besides being cheap, this new food has many of the food factors essential for health, and it may be prepared in so many different ways that it can be served at any meal. The yellow cornmeal, Cornell nutrition specialists pointed out, is high in energy and the only common cereal with a high vitamin A content. The skim milk is a good source of the

bone-building calcium which cereals lack, and of phosphorus, and contains protein essential for building body tissue. The skim milk also furnishes vitamins B and G.

Milkorno is a good foundation food for low cost meals, the food specialists said, when whole milk, vegetables, fruit and a small amount of eggs or meat are added.

"The purpose of such foods as milkorno is to include dried skim milk with cereal and to insure improved nutrition through unconscious practice," explained Prof. Flora Rose, under whose direction the low-cost foods are being developed at Cornell.

Skim milk Long Advocated

The use of dried skim milk has been advocated for some time by nutrition specialists of the U. S. Department of Agriculture. It is used by bakery and ice cream manufacturers who buy it in wholesale lots from dairies, but Uncle Sam's food experts are trying to have it made available in one- and five-pound packages at retail stores for the use of American housewives. If you cannot buy it at your local grocery or bakery, a group of neighbors may get it together in wholesale lots from the manufacturer. A Washington, D. C., dairy sells it in 100-pound lots at \$4 per 100 pounds.

At Cornell the following uses for milkorno are recommended: cooked as a cereal for breakfast or supper; as the main hot dish of a meal in fondues, polenta or tamales; in hot breads as muffins or southern spoon bread; in pancakes; or for desserts when made into cookies or puddings.

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PALEOBOTANY

Fossil Redwood Identical With Living Species

FOSSIL twigs, leaves and cones of a redwood apparently identical with the living Coast Redwood species now found in California have been discovered in several places in Japan by Seido Endo of Tohoku Imperial University, Sendai.

The California species is known as *Sequoia sempervirens*, so that the Japanese botanist has given his fossil finds the name *Sequoia sempervirens fossilis*. His description is published in *The Botanical Gazette*.

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• First Glances at New Books

Geology

THE STORY OF A BILLION YEARS—William O. Hotchkiss—*Williams and Wilkins*, 137 p., \$1. This latest addition to the Century of Progress Series consists of a compact, easily readable outline of the geological history of the earth.

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Biography

SIR BERTRAM WINDLE—Monica Taylor—*Longman's*, 428 p., \$4. The story of one of the most versatile and industrious of the biologists who bridged the late Victorian to Georgian periods. Known to Americans mainly through his able and moderate presentation of the doctrine of evolution from a Catholic's viewpoint, he is here shown to be much more: anatomist, archaeologist, teacher, public man, organizer of university work in England, Ireland and Canada. Much of Sir Bertram's history comes to us in his own words, through the medium of judicious selections from the great mass of his correspondence.

Science News Letter, March 25, 1933

Anthropology

HAWAII AND ITS RACE PROBLEM—W. A. DuPuy—*Govt. Print. Off.*, 131 p., \$1. An account of the mixture that is simmering in America's (and possibly the world's) most complex melting pot.

Science News Letter, March 25, 1933

Zoology

ECONOMIC MAMMALOGY—Junius Henderson and Elberta L. Craig—*Thomas*, 397 p., \$4.50. The first part consists of chapters on such subjects as mammals as food sources, fur, hide and leather trades, mammals as disease carriers, and what might be termed the ecological-economic relationships. The second part takes up the families of mammalia *seriatim*, outlining the economic significances of each.

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Archaeology

THE DRESDEN CODEx—Reproduced by William Gates—*The Maya Society*, 45 p., \$60. Students of Mayan subjects will appreciate this effort of the Maya Society to make the important Dresden Codex accessible and usable. The codex is published, as it was written, in strip form. The material is linen and the coloring is partially by hand. Dr. Gates' rule in reproduction has been: "Where

enough is left to make certain, the lines can be filled in: where anything whatever is in doubt, do not attempt to restore; minor variations of form to be preserved and not ignored." He believes the codex to be complete, as it was first written. Of the three Mayan manuscripts known today, this one is distinguished for its recording of the higher science of the Mayas. Dr. Gates has in preparation an analysis of the codex, to appear shortly. His introduction to the present "volume" is a pamphlet which fits with the strips in their neat case.

Science News Letter, March 25, 1933

General Science—Economics

THE DEVELOPMENT OF AMERICAN INDUSTRIES—Ed. by John George Glover and William Bouck Cornell—*Prentice-Hall*, 932 p., \$6. Basic industries ranging from those dealing with raw materials to travel and banking are covered in this authoritative compilation with chapters written by leaders within the industries. It is really a history of industrial economy in the United States, since the development of the various industries from their early days is recapitulated. The volume deserves a solid niche on the reference shelf.

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Zoology

STRUCTURE OF THE VERTEBRATES—Malcolm E. Little—*Long and Smith*, 392 p., \$3. A text intended for the standard half-year course in comparative anatomy; includes chapters on embryology and evolution as well as the expected descriptions according to phyla and according to organ classes.

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Political Science

THE BALANCE OF THE CONTINENTS—Mariano H. Cornejo—*Oxford*, 213 p., \$2.25. By one of the original members of the Council of the League of Nations, this book treating of war and peace as related to Europe, America and the rest of the world, giving particular attention to the various treaties now in effect, is timely.

Science News Letter, March 25, 1933

Ethnology

AMERICA'S TOMORROW—C. C. Furnas—*Funk and Wagnalls*, 295 p., \$2. An inquiry into the future, readably written, which discusses the physical, natural and social sciences and their effect on the individual and society. See article, p. 181.

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Economics

THORSTEIN VEBLEN—Richard Victor Teggart—*University of California*, 126 p., \$1.75. This monograph subtitled "A Chapter in American Economic Thought" is a critical study of Veblen's life and work. The author says that "Veblen would appear to have been the most important single influence in effecting the break with systematic types of economic theory and with the traditional justification for social institutions in the United States." Scientists and engineers will be interested because of the renewed attention centered upon the economics of Veblen by technocracy.

Science News Letter, March 25, 1933

Electricity-Communication

TELEVISION—K. A. Hathaway—*American Technical Society*, 169 p., \$2. A practical treatise on the principles upon which the development of television is based written by the executive secretary of the Institute of Radio Service Men. This is a concise, illustrated summary of the art, past and present.

Science News Letter, March 25, 1933

Meteorology-Electricity

CODE FOR PROTECTION AGAINST LIGHTNING—*Govt. Print. Off.*, 93 p., 15c. Appendices give data and bibliography on lightning and thunder storms.

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Psychology

"HYPOTHESES" VERSUS "CHANCE" IN THE PRE-SOLUTION PERIOD IN SENSORY DISCRIMINATION-LEARNING AND THE GENESIS OF "HYPOTHESES" IN RATS—I. Krechevsky—*University of California Press*, 37 p., 40c. One of the University of California Publications in Psychology.

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